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BOTANICAL GAZETTE.

Vol. IV.

APRIL, 1879.

No. 4.

OPHIOGLOSSUM PALMATUM, Linn.—A habitant of tropical America from Cuba to South Brazil, and also of the Isle of Bourbon in the Old World, this species was first detected within the limits of the United States by Dr. Chapman, and was published in his enumeration of new plants from the semi-tropical regions of Florida (BOTAN. GAZETTE, Vol. III, p. 20). It does not appear to have been met with by Dr. Garber, Mr. Curtiss, Mr. Shockley and others, whose recent collections in East and South Florida have added many species to the list of North American Ferns, and have verified to some extent the prediction, that the Everglades, if ever thoroughly explored, would contribute largely to our *Cryptogamiæ*.

It was my good fortune, in March, 1878, to come across *O. palmatum*; and the interest in finding it was enhanced by the fact that its discovery by Dr. Chapman had not at that time been published. The plant is probably quite rare, at least north of lat. 20 degrees, 40 minutes. In the course of an extended trip along the Gulf Coast region from Cedar Keys to Charlotte Harbor, and up the Caloosahatchee River, ninety miles, to its source near Lake Okeechobee, I observed this *pseudo* Fern in only one spot: a Palmetto swamp about a mile back from the north bank of the Caloosahatchee, some sixty miles above Punta Rasa, and about eight miles west-north-west from the old site of Fort Simmons. The locality seemed to offer no peculiar conditions, beyond the fact that it exhibited no traces of having been visited by fires. The only specimens found grew upon two *Sabal Palmetto* trees, fifteen to twenty feet from the ground, rooted in the axils and under the sheaths of the dead petioles—much after the manner of another epiphytal, a true Fern common in those parts, *Polypodium aureum*.

Omitting the characters of this species to be found in the descriptions of authors, the following details, chiefly supplemental, are taken from my specimens; and it is to be noted, that these are in every way smaller, and have fewer lobes and spikes, than the specimens described or figured from more tropical countries:

Rhizome thick, fern-like, producing 1-3 fronds, mostly without fruit; same root-stock sometimes bearing a persistent dead frond, a

green one with withered spikes of empty sporangia, another one with matured fruit, and a minute young frond; rootlets profuse, stout, forking dichotomously. Sterile segment undulate, divisions 1-4, sometimes forking once or twice, acutish, pendulous, sinuses wrinkled or plicate. Fertile segments or "spikes" 1-4, arising at intervals or clustered from the stipe, the basal margins, or the intramarginal lamina near the base of the sterile segment, recurved; peduncles 6 lines long, spikes 6 lines to one inch long and one line broad; sporangia 14-20 pairs.

The external structure of the frond in this species as also in *O. pendulum*, indicates the unity of the barren and fertile parts in *Ophioglossaceæ*, and that together they constitute a "branched leaf." (Sachs) This theory is in opposition to the earlier hypothesis of a cohesion of the two spikes of a barren and of a fertile frond. In *O. palmatum*, therefore, the highly developed frond may be described as branching into one barren, and numerous fertile, segments; the former again dividing into dichotomously forking lobes.

Branching thus like the horns of elks, and thick and fleshy in texture while living, this curious epiphyte has probably recalled to others as well as myself, the exotic Fern, which is often seen attached to the wall of conservatories, *Platyterium alcinorne*.

The species is so distinct from all its congeners, that Presl founded upon it a separate genus, which he called *Cheiroglossum*, in allusion to the resemblance of the sterile segment to a *hand*, and of the fertile ones to *tongues*.—JOHN DONNELL SMITH.

PHYLLOTAXY OF LEAVES, by A. P. Morgan (concluded from Feb. GAZETTE).—15. The secondary spirals are of essential service in determining the arrangement of the leaves when they are thickly crowded upon the stem, as is the case with the leaves of the Houseleek and the scales of Pine Cones. The intermediate spirals are the most plainly to be seen; those adjacent to the vertical ranks and to the primary spiral are the most obscure. Having determined two consecutive orders of spirals, one winding to the right and the other winding to the left, the sum of their numbers of spirals gives the next higher order of spirals, and their difference gives the next lower order. The other orders of spirals may be determined in like manner until the primary generating spiral and the vertical ranks are reached.

16. A single example will illustrate the manner of finding the cycle by means of the secondary spirals. Take for example the cone of the White Pine (*Pinus Strobus*) (Figs. 5 and 6). The process of